

What Is Claimed Is:

1. A method for producing multi-segmented filaments comprising:

(a) passing a first polymer material into a die, the first polymer material and the die being maintained under predetermined rheological conditions;

(b) extruding the first polymer material through a plurality of die openings in the die, the die openings arranged in a group, the group configured to form at least two elementary filaments; and

(c) connecting the two elementary filaments by adhesion contact to form a multi-segmented filament.

2. The method of claim 1 wherein step (b) includes the sub-step of:

(i) forming a skin on the elementary fibers.

3. The method of claim 1 further comprising:

(d) stretching the multi-segmented filament.

4. The method of claim 1 wherein the die openings are further configured such that a first bead of the polymer material exiting a first die opening in the group comes in contact with a second bead of polymer material exiting a second die opening in the group.

5. The method of claim 1 wherein the closest distance between a first die opening from the plurality of die openings and a second die opening from the plurality of die openings is equal to or greater than a quarter of the sum of the diameters of the first die opening and the second die opening and is less than or equal to two and a half times the sum of the diameters from the first die opening and the second die opening.

6. The method of claim 1 wherein the closest distance between a first die opening from the plurality of die openings and a second die opening from the plurality of die openings is equal to or greater than a quarter of the sum of the diameters from the first die opening and the second die opening and is less than or equal to the sum of the diameters from the first die opening and the second die opening.

1 7. The method of claim 1 wherein the die openings are configured to form a multi-segmented
2 filament having a predetermined dimension and configuration.

1 8. The method of claim 1 wherein each of the plurality of die openings are supplied with the
2 first polymer material.

1 9. The method of claim 1 wherein step (a) further comprises passing a second polymer
2 material into the die under predetermined rheological conditions.

1 10. The method of claim 9 wherein step (b) further comprises extruding the second polymer
2 material through one of the plurality of die openings.

1 11. The method of claim 1 wherein once made, the adhesion contact between the first and the
2 second filament is continuous and uninterrupted.

1 12. The production process according to claim 1 wherein a first die opening from the
2 plurality of die openings determines the adhesion contact point between the first filament and
3 the second filament.

1 13. A die for producing multi-segmented filaments comprising:
2 a polymer source maintaining a polymer under predetermined rheological conditions;
3 a die in communication with the polymer source, the die maintaining the polymer
4 under predetermined rheological conditions; and
5 a die plate in fluid communication with the die, the die plate defining a first group of
6 openings, the first group of openings comprising a first opening and a second opening, the
7 first opening and the second opening configured to form a first elementary fiber having a skin
8 and a second elementary fiber having a skin.

1 14. The die of claim 13 further comprising:
2 a second polymer source in communication with the die.

156
425/441
500
425/131.1
131.5
382.2
392.2
464

1 15. The die of claim 13 wherein the die plate defines a second group of openings, the second
2 group comprising a third opening and a fourth opening, the third opening and the fourth
3 opening configured to form a third elementary fiber having a skin and a fourth elementary
4 fiber having a skin.

1 16. A die plate for producing multi-segmented filaments comprising:
2 a die plate having a first opening and a second opening, the distance between the first
3 opening and the second opening being equal to or greater than a quarter of the sum of the
4 diameters of the first opening and the second opening and the distance between the first
5 opening and the second opening being less than or equal to two and a half times the sum of
6 the diameters from the first opening and the second opening.

1 17. A die plate for producing multi-segmented filaments comprising:
2 a die plate having a first opening and a second opening, the distance between the first
3 opening and the second opening is equal to or greater than a quarter of the sum of the
4 diameters of the first opening and the second opening and the distance between the first
5 opening and the second opening is less then or equal to the sum of the diameters of the first
6 opening and the second opening.

1 18. A multi-segmented filament comprising:
2 a first elementary fiber having a skin; and
3 a second elementary fiber having a skin;
4 wherein the first elementary fiber is connected longitudinally to the second
5 elementary fiber by adhesion of the skin of the first elementary fiber with the skin of the
6 second elementary fiber.

1 19. A method of manufacturing a textile material comprising:

2 (a) passing a first polymer material into a die, the first polymer material and the die
3 being maintained under predetermined rheological conditions;

4 (b) extruding the first polymer material through a plurality of die openings, the die
5 openings arranged in a group, the group configured to form at least two elementary filaments;

6 (c) combining, by adhesion contact, the elementary filaments into a second filament
7 having a multi-segmented cross-section; and

8 (d) placing the second filament having a multi-segmented cross-section into a textile
9 material.

10 20. The method of manufacturing a textile material of claim 19 further comprising, after step
11 (c), the sub-step of:

12 (i) separating a portion of the second filament into its elementary filaments by
13 mechanical or chemical forces.